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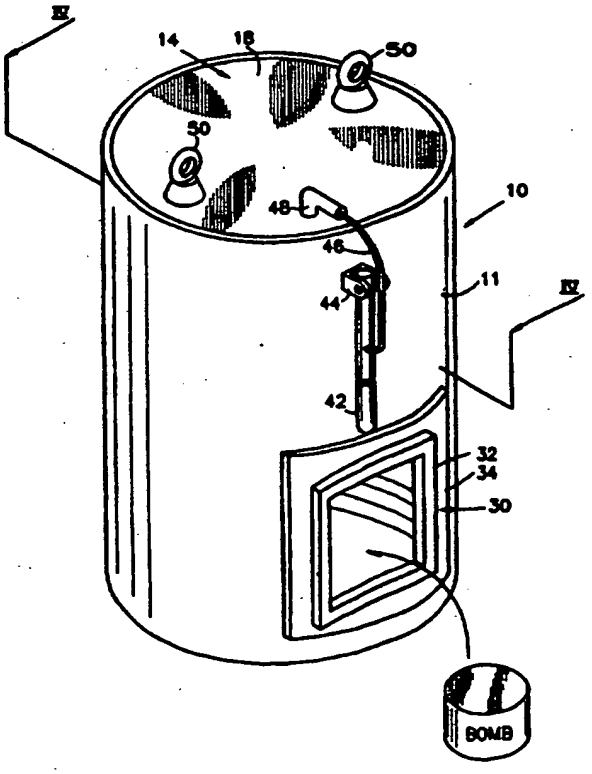
(54) Title: SECURITY CONTAINER

(57) Abstract

This invention discloses an explosion resistant container including at least one cylindrical wall portion formed of a ballistic resistant material, having disposed therewithin a generally coaxial cylindrical layer of a high density foamed engineering resin.



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SECURITY CONTAINER

FIELD OF THE INVENTION

The present invention relates to security containers generally and more particularly to explosive resistant containers.

BACKGROUND OF THE INVENTION

With the recent rise in urban terrorism, explosive devices and articles perceived to be possible explosive devices are found in proximity to highly populated locations on a regular basis. Apparatus for quick and secure disposal of such devices and articles are required.

In certain parts of the world, terrorists have deposited explosive devices in street refuse containers. As a result certain municipalities have removed street refuse containers from sensitive locations, with attendant deleterious effects on public hygiene.

SUMMARY OF THE INVENTION

The present invention seeks to provide an improved explosion resistant container. Such a container, suitable configured can be used for bomb disposal within a building, or alternatively as a street refuse container.

There is thus provided in accordance with a preferred embodiment of the present invention an explosion resistant container including at least one cylindrical wall portion formed of a ballistic resistant material, having disposed therewithin a generally coaxial cylindrical layer of a high density foamed engineering resin.

In accordance with one embodiment of the present invention, a second cylindrical wall portion may be located interiorly of the cylindrical layer of a high density foamed engineering resin. The engineering resin preferably comprises high strength, high density polyphenylene oxide polystyrene.

Preferably, a blast resistant container bottom is also provided.

In accordance with one embodiment of the invention, the container does not have a top, allowing part of the force of the blast to be directed upwardly. Alternatively, a blast resistant container top may also be provided.

Preferably, at least one and most preferably both the container bottom and top are bowed inwardly for enhanced blast resistance.

BRIEF DESCRIPTION OF THE DRAWINGS

The present invention will be understood and appreciated more fully from the following detailed description, taken in conjunction with the drawings in which:

Figs. 1 and 2 are simplified pictorial illustrations of a bomb disposal container constructed and operative in accordance with a preferred embodiment of the present invention in respective sealed and open operative orientations;

Figs. 3 and 4 are sectional illustrations, taken along respective lines III - III and IV - IV in respective Figs. 1 and 2;

Figs. 5 and 6 are pictorial illustrations showing the effects of an explosion within the container of Figs. 1 - 4;

Figs. 7, 8 and 9 are simplified pictorial illustrations of the structure and operation of an open-topped security container constructed and operative in accordance with a preferred embodiment of the present invention.

DETAILED DESCRIPTION OF PREFERRED EMBODIMENTS

Reference is now made to Figs. 1 - 4, which illustrate a bomb disposal container constructed and operative in accordance with a preferred embodiment of the present invention.

As seen in the drawings, the container is generally cylindrical, including a cylindrical wall assembly 10 defining an outer cylindrical wall surface 11, preferably formed of steel of thickness typically 1.0 - 1.3 mm. Disposed interiorly of wall surface 11 is an interior layer 12 preferably a high strength, high density foamed engineering resin, preferably a polyphenylene oxide polystyrene resin. A preferred resin is a GECET expandable engineering resin, which is commercially available from GE Plastics of Pittsfield MA, U.S.A. The precise density and thickness of the resin employed is determined empirically by operational requirements, including the size of the container.

Top and bottom wall assemblies 14 and 16 may also be provided with respective outer layers 18 and 20 of steel and respective inner layers 22 and 24 of a foamed engineering resin, such as that described above. In accordance with a preferred embodiment of the invention, the top and bottom wall assemblies 14 and 16 may be bowed inwardly.

Associated with the cylindrical wall assembly 10 is a side door assembly 30, including a transversely extending steel frame 32, surrounded by a curved reinforcing plate 34. In accordance with a preferred embodiment of the invention, a second cylindrical wall portion may be located interiorly of layer 12.

A liftable door assembly 36 is provided, preferably including a steel outer plate 38 and an inner layer 40 of a foamed engineering resin, such as that

described hereinabove. Preferably, the door is lifted by a lever arrangement including a handle member 42, pivotably mounted onto a base 44, mounted on the outer side wall 11 and connected to a cable 46, which extends through a channel 48 to the top of the door assembly 36, as shown. Exterior lifting rings 50 may also be provided on the top wall assembly 14.

It is a particular feature of the present invention that when a blast occurs within the container, as illustrated figuratively in Figs. 5 and 6, the top and bottom surfaces tend to bow outwardly, absorbing large quantities of blast energy. The side walls likewise bow outwardly. The engineering resin layers tend to become compressed by the force of the blast, thus absorbing significant energy and also serve to significantly limit the passage of shrapnel therethrough.

Reference is now made to Figs. 7, 8 and 9 which are simplified pictorial illustrations of the structure and operation of an open-topped security container constructed and operative in accordance with a preferred embodiment of the present invention. The container of Figs. 7 - 9 preferably is formed of a cylindrical side wall assembly 60 including an outer steel wall 62 and an inner layer 64 of a foamed engineering resin, such as that described hereinabove.

It is a particular feature of the present invention that when a blast occurs within the container, as illustrated figuratively in Figs. 8 and 9, the bottom surface tends to bow downwardly and part of the blast energy is directed upwardly, rather than sideways where it presumably could cause more damage. The engineering resin layers tend to become compressed and or disintegrated by the force of the blast, thus absorbing significant energy and also serve to significantly limit the passage of shrapnel therethrough. It will be appreciated by persons skilled in the art that the present

invention is not limited by what has been particularly shown and described hereinabove.

C L A I M S

1. An explosion resistant container including at least one cylindrical wall portion formed of a ballistic resistant material, having disposed therewithin a generally coaxial cylindrical layer of a high density foamed engineering resin.

2. An explosion resistant container according to claim 1 and wherein a second cylindrical wall portion is located interiorly of the cylindrical layer of a high density foamed engineering resin.

3. An explosion resistant container according to either of claims 1 and 2 and wherein said engineering resin comprises high strength, high density polyphenylene oxide polystyrene.

4. An explosion resistant container according to any of the preceding claims and wherein a blast resistant container bottom is also provided.

5. An explosion resistant container according to claim 4 and wherein said container does not have a top, allowing part of the force of the blast to be directed upwardly.

6. An explosion resistant container according to claim 4 and also comprising a blast resistant container top.

7. An explosion resistant container according to any of the preceding claims and wherein said container includes at least one of a container top and container bottom which are bowed inwardly for enhanced blast resistance.

FIG. 1

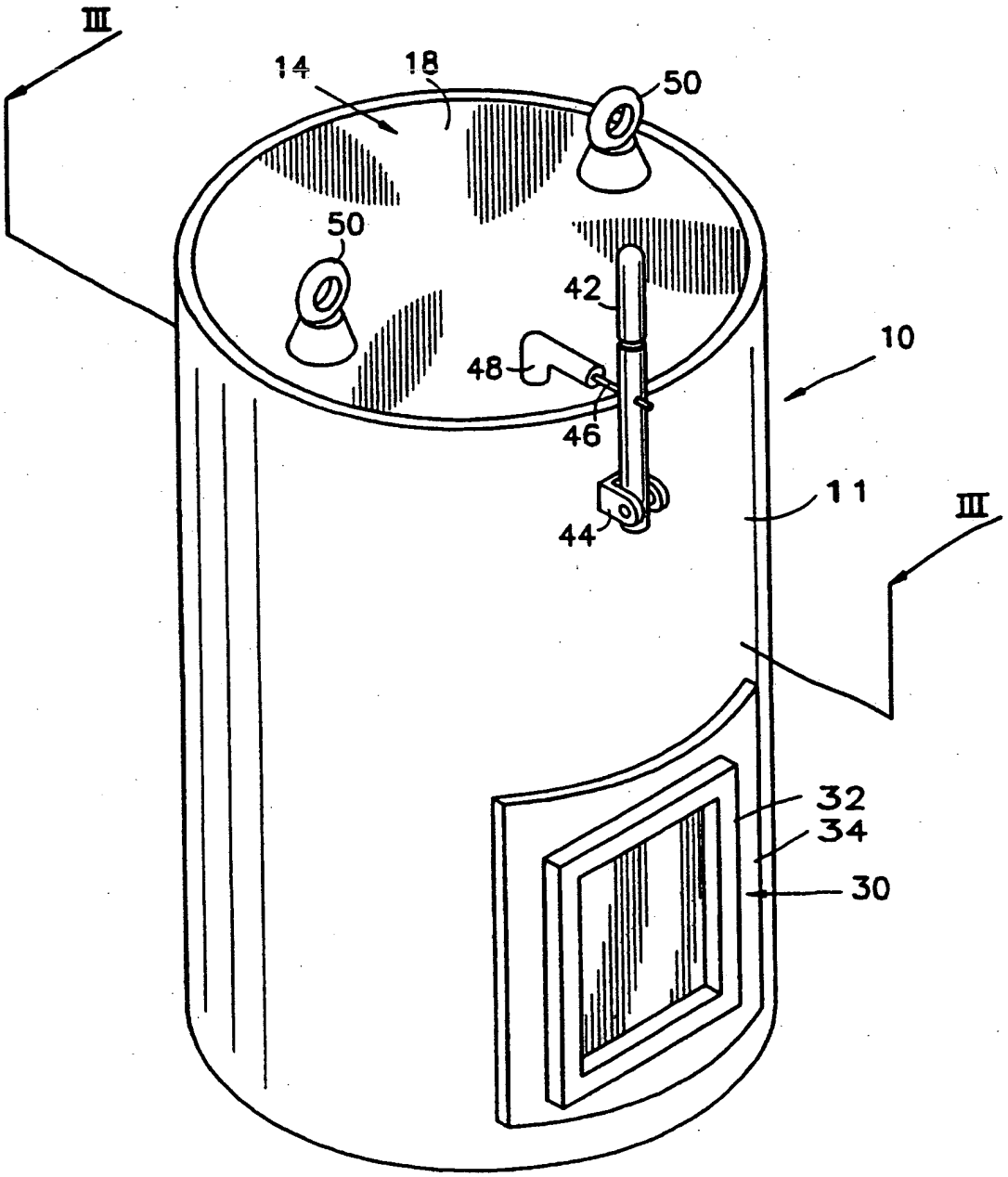
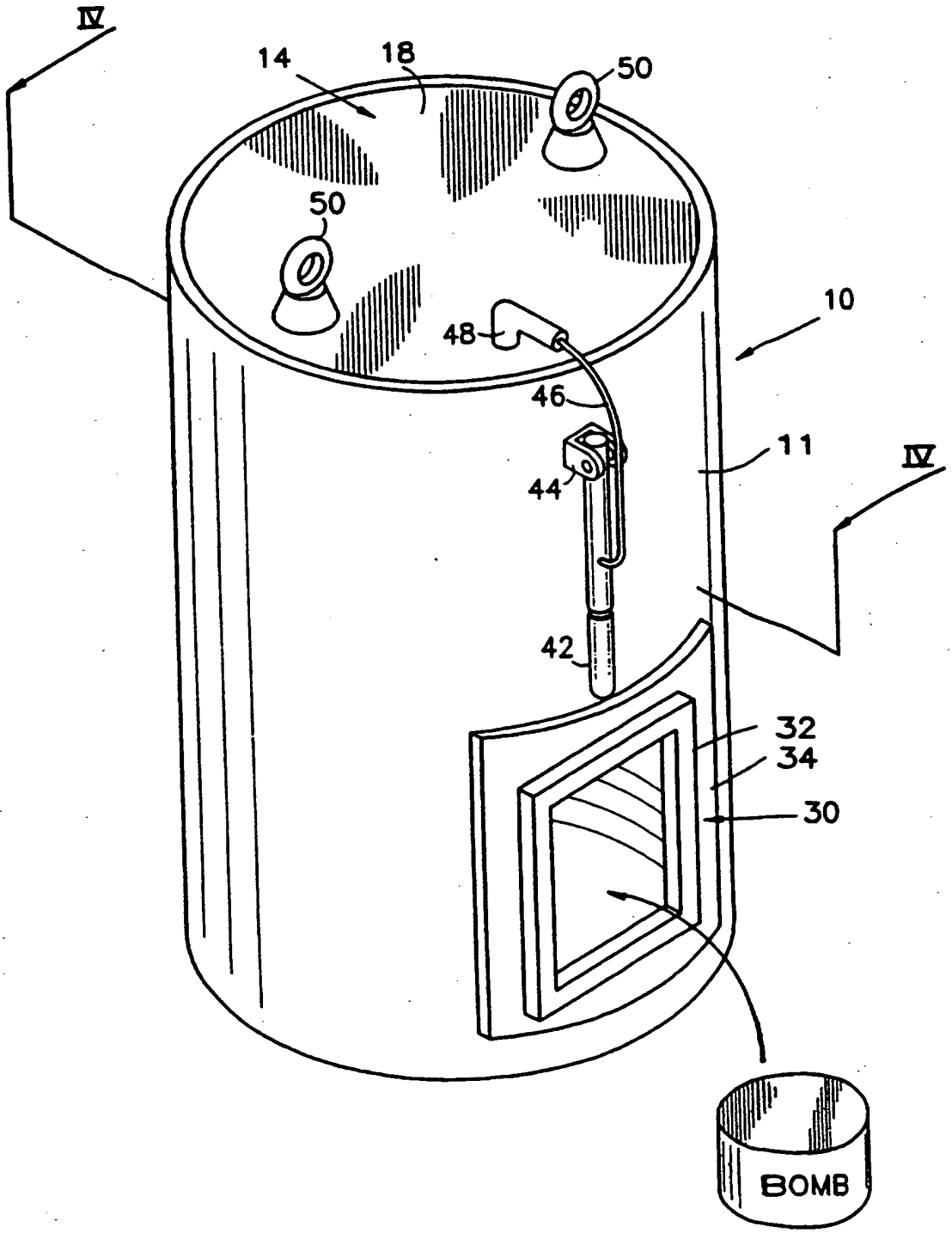


FIG. 2



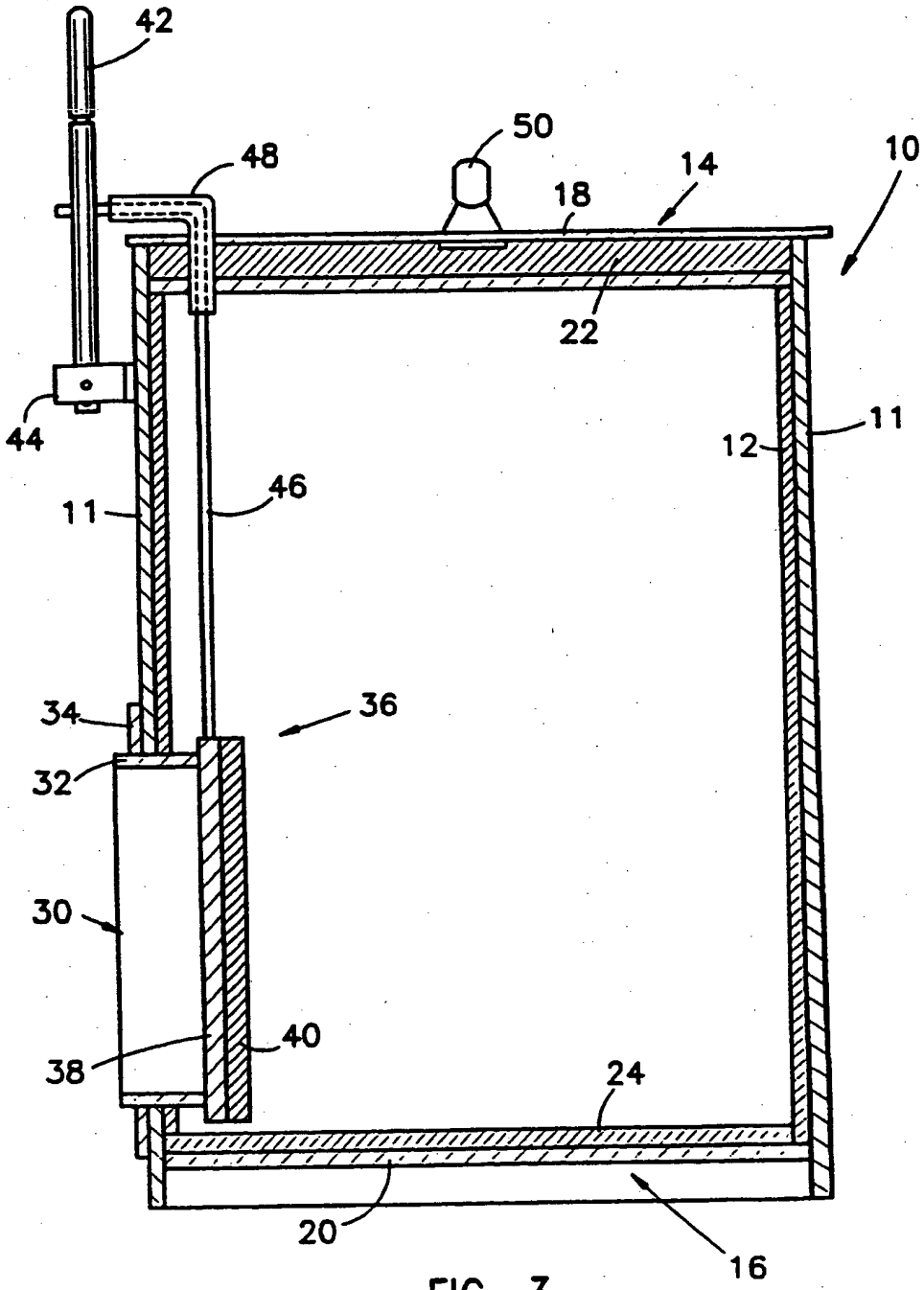


FIG. 3

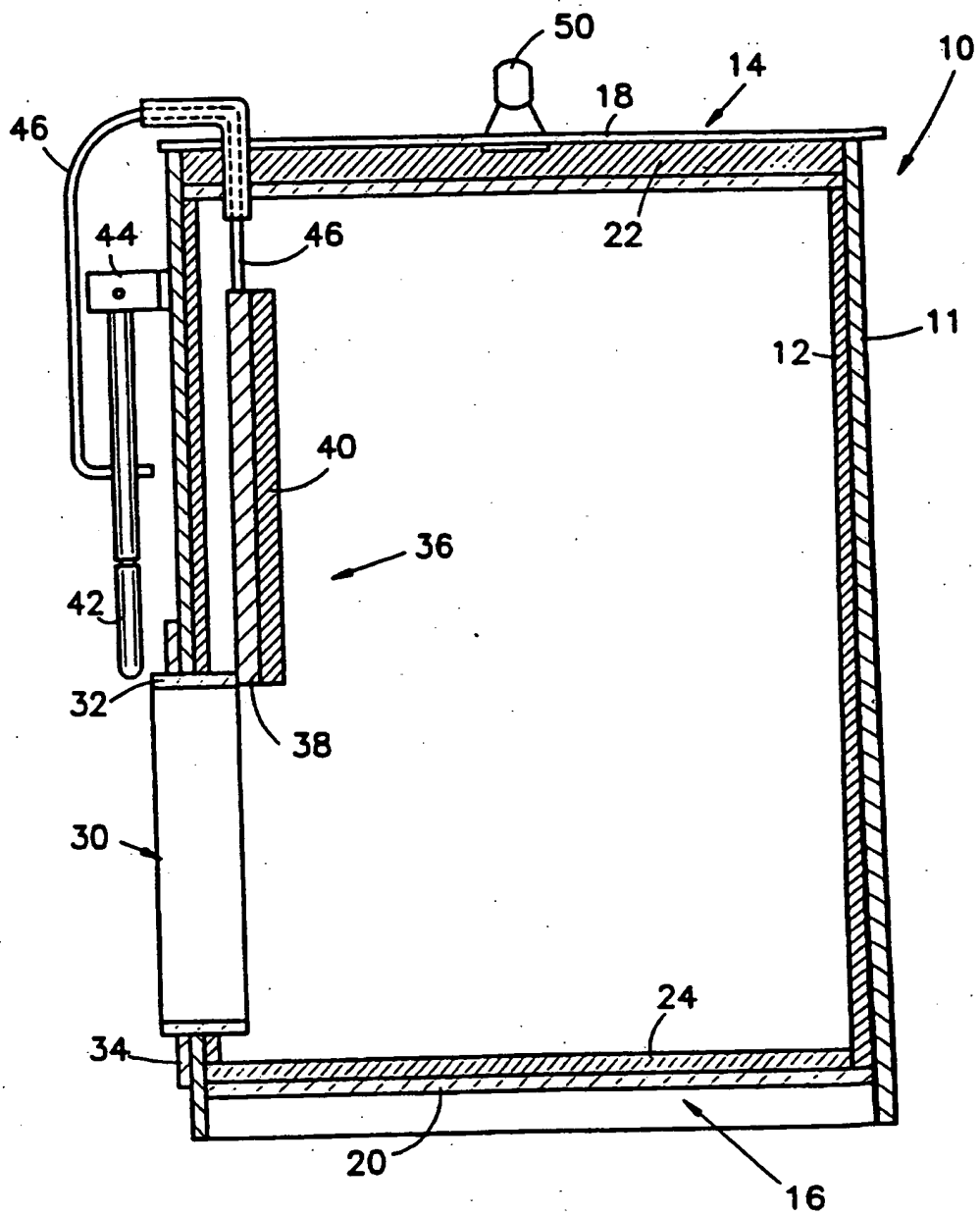


FIG. 4

FIG. 5

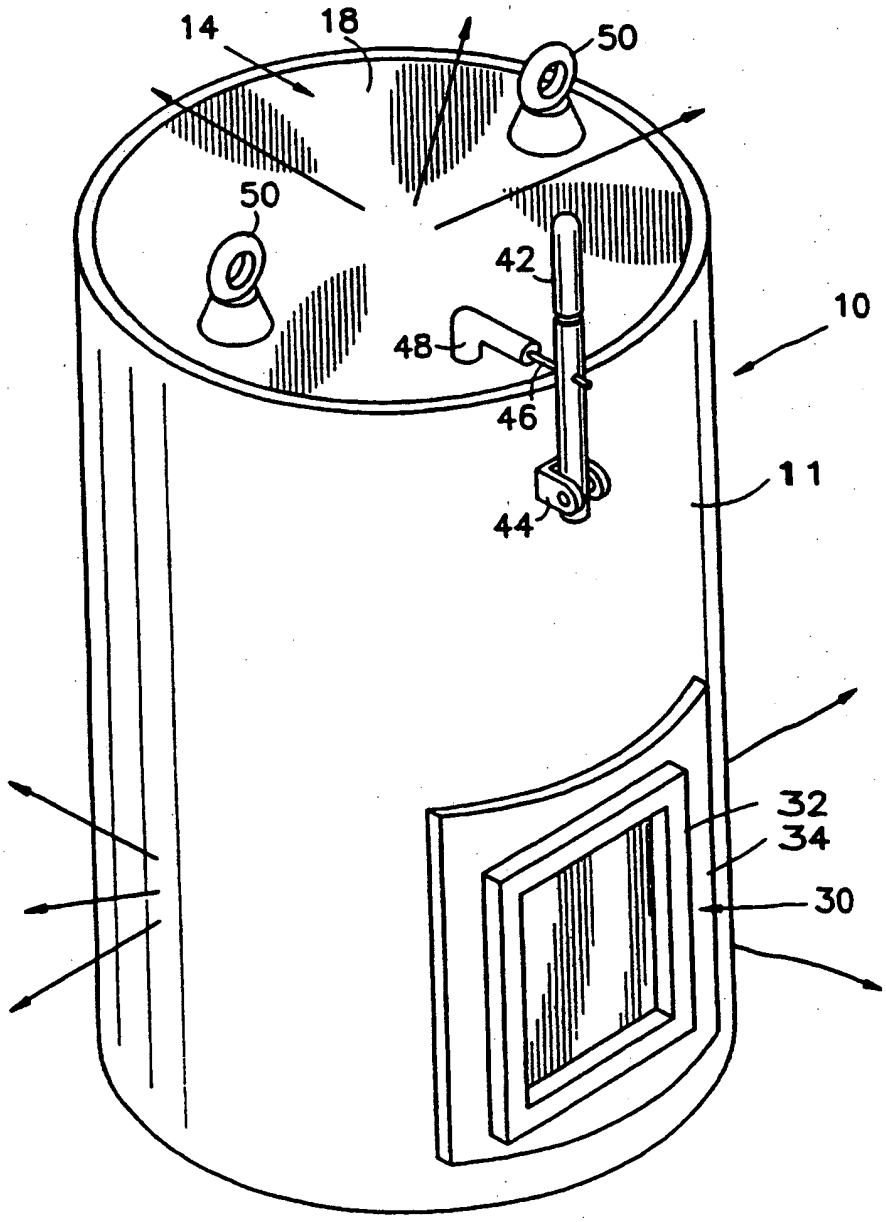
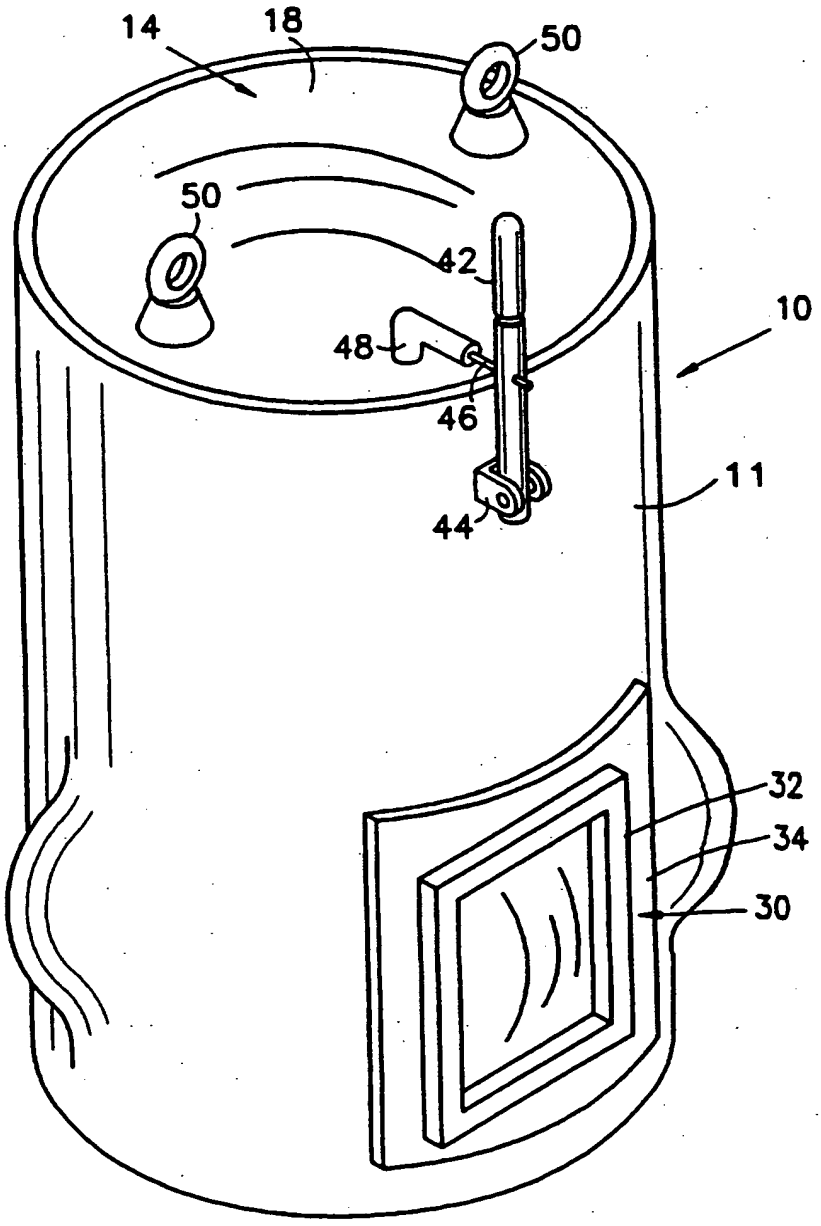


FIG. 6



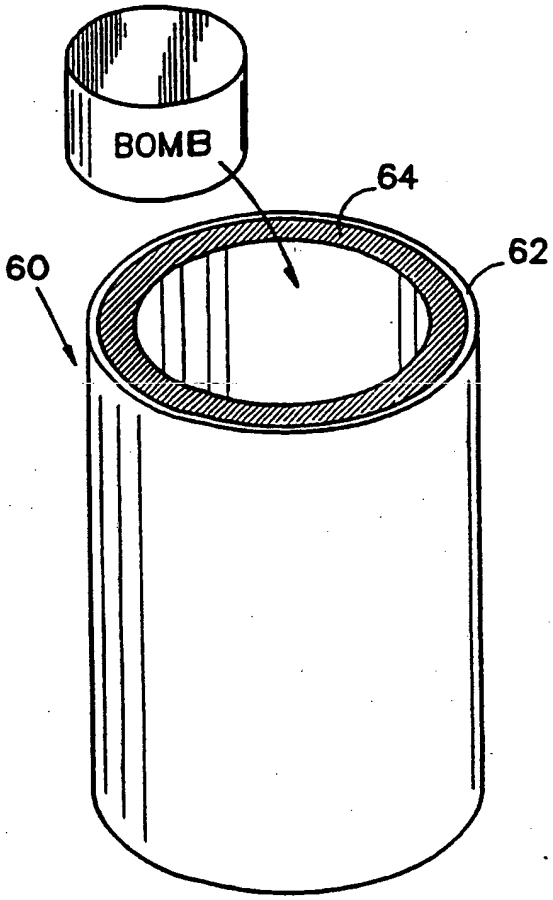


FIG. 7

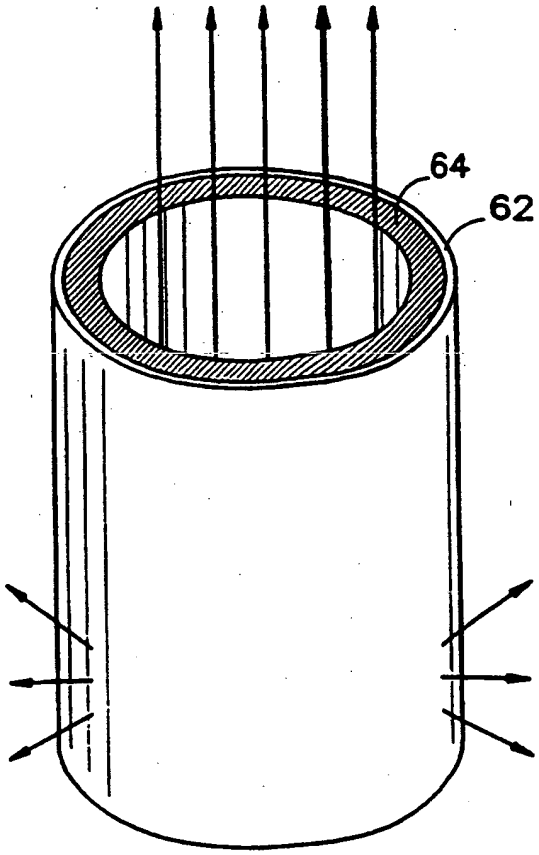


FIG. 8

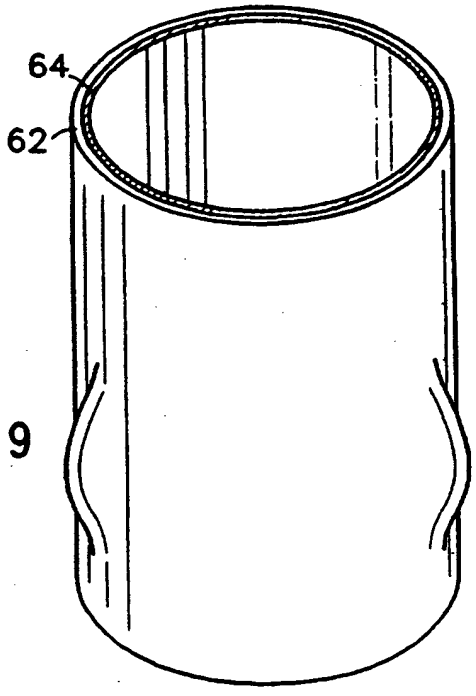


FIG. 9

INTERNATIONAL SEARCH REPORT

International Application No
PCT/NL 95/00285

A. CLASSIFICATION OF SUBJECT MATTER
IPC 6 F42B39/14

According to International Patent Classification (IPC) or to both national classification and IPC

B. FIELDS SEARCHED

Minimum documentation searched (classification system followed by classification symbols)
IPC 6 F42B

Documentation searched other than minimum documentation to the extent that such documents are included in the fields searched

Electronic data base consulted during the international search (name of data base and, where practical, search terms used)

C. DOCUMENTS CONSIDERED TO BE RELEVANT

Category *	Citation of document, with indication, where appropriate, of the relevant passages	Relevant to claim No.
X	WO,A,93 06430 (SRI INTERNATIONAL) 1 April 1993 see page 9, line 17 - page 15, line 10; figures	1-7
A	AU,A,626 512 (BURTON) 11 June 1992 see page 3, line 25 - page 4, line 14; figures	1-7
A	US,A,3 731 585 (DEMBERG ET AL.) 8 May 1973 see column 2, line 13 - column 3, line 2; figures	1-7
A	US,A,4 027 601 (HICKERSON) 7 June 1977 see column 1, line 62 - column 2, line 68; figures	1-7

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[X] Further documents are listed in the continuation of box C.

[X] Patent family members are listed in annex.

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Date of the actual completion of the international search	Date of mailing of the international search report
1 December 1995	12.12.95

Name and mailing address of the ISA	Authorized officer
European Patent Office, P.B. 5818 Patentlaan 2 NL - 2280 HV Rijswijk Tel. (+ 31-70) 340-2040, Tx. 31 651 epo nl, Fax (+ 31-70) 340-3016	Olsson, B

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Category '	Citation of document, with indication, where appropriate, of the relevant passages	Relevant to claim No.
A	US,A,4 187 758 (PETTY) 12 February 1980 see column 2, line 16 - line 54; figures	1-7
A	US,A,4 440 296 (HOWE ET AL.) 3 April 1984 see column 3, line 5 - line 58; figures	1-7

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INTERNATIONAL SEARCH REPORT

Information on patent family members

International Application No
PCT/NL 95/00285

Patent document cited in search report	Publication date	Patent family member(s)		Publication date
WO-A-9306430	01-04-93	US-A-	5267665	07-12-93
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US-A-4027601	07-06-77	NONE		
US-A-4187758	12-02-80	NONE		
US-A-4440296	03-04-84	NONE		